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tober 18th an excursion to Popotla was made by wagons, starting from 'la Plaza de la Constitución,' opposite the 'Portal de Mercaderes.'

This was chiefly a visit 'al árbol de la Noche Triste,' the famous tree against which Cortes rested and wept on the night of his terrible defeat. The tree, unfortunately, seems dying, but its tremendous trunk, a wooden tower, may still be a landmark for centuries.

The tree of Montezuma, at the back of Chapultepec, is still flourishing, one the grandest and most impressive of living things on this earth.

At ten o'clock a visit was made to 'la Escuela Nacional de Ingenieros,' where is perhaps the greatest collection of large meteorites in the world.

At four o'clock again in session in the Escuela Preparatoria.

But already we have followed long enough to give an insight into the life of this most enjoyable Congress, and while the fortunate Americanistas go south by rail to Oaxaca, thence to ride to Mitla, digging in the prehistoric past, we face again the unsoftened raw newness of our own United States.

GEORGE BRUCE HALSTED.

AUSTIN, TEXAS.

RECENT INVESTIGATIONS UPON THE EMBRYOLOGY AND PATHOLOGY OF TEETH.

THE embryonic development of the teeth is now a subject of most active investigation, and we are constantly receiving new communications from Leche, in Stockholm; Kükenthal, in Jena, and Röse, in Freiburg. The most striking discovery is that of the existence throughout the mammalia of remnants of two series of teeth, preceding the milk and permanent series. The teeth represented in these two series are entirely vestigial; both precede the embryonic development of the milk teeth, and are indicated merely by indentations of the

dental fold. So far as known, these germs never develop enamel, but they constitute the most positive evidence of the derivation of the mammalia from reptilian or amphibian ancestors with a multiple dental succession. These 'prelacteal' teeth, as they are called, were first observed by Leche, in 1892, in certain Insectivora, but they have subsequently been found among the Marsupialia and in the seals. Röse has now found unmistakable vestiges of these teeth in the human jaw. Man, therefore, in common with many other mammals has four sets of teeth, instead of two as formerly supposed.

Röse's investigations upon the teeth of Amphibia Reptilia and fishes demonstrate conclusively the truth of Hertwig's theory that teeth are modified scales which have passed into the mouth cavity. He finds that the rudiments of the first series of teeth in each of these types develop exactly after the manner of the placoid dermal scale. The second series of teeth develop after an intermediate type, and it is only the third series of teeth which develop from the typical dental fold lying suspended within the mesoblast, or lower tissue of that layer. Dr. Röse, with Prof. Kükenthal, of Jena, has been the most active supporter of the theory of the origin of complex tooth crowns by concrescence of primitively separate cusps, and this 'concrecence theory' has spread very rapidly in Germany as an explanation of the mode of origin of the elaborate tooth forms. There are very slight grounds of evidence for it among the mammalia; in fishes, however, it has long appeared probable that the well-known type of shark tooth (*Lamna*), consisting of three cusps united at the base, so abundantly found in the phosphate beds of South Carolina, represents a concrescence. Röse has now made a very careful study of the tooth development of *Chlamydoselachus anguineus*, Garman, and finds conclusive evidence that the com-

pound crowns of this type are formed by the concrecence of three separate denticles.

Dr. Carl Röse has also completed a most valuable investigation upon the causes of the decay of teeth. (*'Ueber die Zahnverderbniss in den Volksschulen.'*) With the aid of two colleagues, in the schools of Freiburg and the Black Forest he has examined 7,364 children and 179,087 teeth. Special objects of the investigation were the relations of dental caries to the geology of the country, and the presence of a greater or less amount of lime salts in the water, and, secondly, the influences of the consumption of different kinds of farinaceous food. In general the use of water or food poor in lime salts affects the development of the teeth very unfavorably; and the use, especially, of fine milled white bread is very prejudicial to sound teeth, whereas the use of the common black bread keeps the teeth clean and the gums in a healthy condition. As regards stratigraphy the investigation shows that as we pass from granitic to overlying calcareous formations there is a steady decrease in the number of unsound teeth—falling from 35.3 to 16.1%. These figures are taken without regard to the character of the bread and other food consumed by the children and show exclusively the influence of water. The conclusion is that the worst teeth of the calcareous districts are always better than the very best teeth found within the non-calcareous districts, the degeneration of the teeth being indicated by a yellowish white and bluish gray color.

In the matter of food, meat is a great luxury among the peasant children, enjoyed, if at all, only upon Sundays, and can be left entirely out of account. Dr. Röse finds that the consumption of the German 'Kuchen' (made of white flour with milk, butter or oil and more or less sugar, raisins, etc.) is very prejudicial to the teeth; and, in fact, the very worst teeth are regularly

found within those districts where these cakes are habitually consumed. The conclusion as to food is that the very best form of foods, so far as teeth are concerned, is the black bread with its coarse, thick crust. The investigation extends to the relation between the general condition of the mouth and gums and epidemics of diseases such as diphtheria, which principally affect children, and Dr. Röse maintains that there is a direct relation between the unhealthy condition of the teeth and gums and a predisposition to epidemic diseases. He believes that in times of epidemics these disease germs are found in the mouths of nearly all children and that a healthy condition of the mouth resists the infectious power of the germ. As regards sex, there is very little difference between the boys and girls in the matter of decay. It is an interesting point that the development of the teeth is very much more rapid in girls than in boys, so that in children of the same age a much larger proportion of milk teeth are found among boys than among girls.

The article closes with a strong appeal for the education of children in the schools in the proper care and protection of the teeth, and the author recommends not only the careful instruction of children in this respect, but also the award of prizes.

H. F. O.

CURRENT NOTES ON PHYSIOGRAPHY.

THE MARGINAL PLAIN OF CHINA.

SKERTCHLY AND KINGSMILL describe 'the loess and other superficial deposits of Shantung, North China' (Quart. Journ. Geol. Soc., London, li, 1895, 238-253), recognizing the alluvial delta plains of the great rivers, a plain of marine sands, and a somewhat denuded lowland of loess. The delta of the Yangtse is estimated to increase by two square miles a year. The sandy marine plain is broadly developed over a bay-like area up the Yellow River,